

New Devices for Volumetric Metering of Delivered Water - Trash Shedding Propeller Meters

Goal: Provide farmers and irrigation districts with practical means of measuring the volumes of water delivered, spilled, reused, etc. This research will address the conditions for which we do not presently have a commercially viable solution.

Technology Path: The most popular flow rate and volumetric metering device for irrigation district turnouts is the propeller meter. It is simple to understand, robust, and relatively easy to maintain. Many irrigation districts have short, full pipe sections at the turnouts into which propeller meters can be installed. The single biggest problem in those situations is trash in the water that catches on the propeller or support arm. (Work Authorization 4 addresses other conditions.)

This trash problem is similar to that of propellers for outboard motors on boats. For boats, special propellers and shielding mechanisms have been designed to keep boat propellers "clog-free". A propeller meter configuration has been proposed in which the propeller is mounted either backwards or behind the support shaft, but this configuration has never really been implemented with a serious effort. Global Water Technologies of Gold Run, California recently built a "backwards" configuration propeller meter, but the technology which that company uses for the moving parts, totalizer, etc. is not recognized in the industry as being durable.

Some of the mainstream propeller meter manufacturers now have excellent bearings and magnetic drives on their propeller meters, which would allow them to reconfigure the support shaft and the orientation of the propellers, themselves.

Water Specialties and McCrometer (2 major manufacturers of propeller meters in the irrigation district market) have made some initial improvements in their design to help minimize this problem and are interested in participating in this task. This project will enable ITRC to work with propeller meter manufacturers to develop some prototypes of trash-shedding propeller meters. The meters would be calibrated in the manufacturer's test facilities, and then field tested by ITRC in an irrigation district with trash problems.

Principal Investigator:

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